Control device with a disengageable crown for a wristwatch

The present invention refers to a control device with decoupling crown for a watch, and more particularly to a control device in which the coupling and decoupling of the crown occur outside the movement.

Decoupling crowns called "screw-down" are known that can take up a coupled position where the crown is engaged with a driving stem outside the movement, and a decoupled position where the crown is disengaged from this driving stem. The change from one position of the crown to the other is obtained by screwing and unscrewing the crown in a crown tube. This operation is unpractical for users. Moreover, upon repeated use the screw threads of crown and tube tend to be damaged, particularly so at their front ends, which may necessitate replacement of this crown and tube.

The present invention aims at obviating these disadvantages, and to this end proposes a decoupling-crown control device for a watch according to appended claim 1, while specific embodiments of this device are defined in the dependent claims, as well as a watch incorporating it.

Further features and advantages of the present invention will become apparent when reading the following detailed description given while referring to the appended drawings where Figures 1 and 2 show the control device of the invention in a decoupled state and in a coupled state in sectional views.

Referring to Figures 1 and 2, a control device 1 with water-resistant decoupling crown according to the invention comprises a fixed supporting tube 10 driven into a bore 2 formed in the body (middle) 3 of a watchcase, a drive shaft 11 inserted in the fixed tube 10 that is integral with a driving stem 4 of the watch, as well as a crown 12 consisting of a crown head 13 and of a tube 14 integral with head 13 and mounted rotatably and translatably between the inner wall 10' of fixed tube 10 and the drive shaft 11. The drive shaft 11 bears outer teeth 15, the mobile tube 14 bears corresponding inner teeth 16.

An annular groove 17 formed in the inner wall 10' of the fixed tube 10 constitutes the seat for a thoric gasket 18. The outside of the mobile tube 14 has two structures, here a first and a second annular groove 19, 20, that can cooperate with gasket 18 in order to define two stable axial positions for crown 12. In the open or pulled position that is indexed by gasket 18 and groove 19 (Figure 2), the teeth 15 and 16 are engaged so as to

enable drive shaft 11 and, thus, the driving stem 4 to be rotated when crown 12 is turned by the user. This open position is a working position where a rotation of crown 12 controls a particular function in the watch, such as a rotation of the city disc for time-zone display or any other, analogous function. In the closed or pushed position that is indexed by gasket 18 and groove 20 (Figure 1), teeth 15 and 16 are not engaged, so that crown 12 may freely turn without driving the shaft 11. This closed position is a rest position of the mechanism where no particular function of the watch is controlled when crown 12 is turned by the user.

Two stops 21, 22, the first consisting of a collar extending around drive shaft 11 and the second consisting of the head of a screw screwed into the end of shaft 11 farthest from the watchcase, limit the axial movement of crown 12 in the direction where crown 12 comes closer to the watchcase, and in the opposite direction where crown 12 moves away from the watchcase.

Moreover, gaskets 23 and 24 arranged between the bottom portion of fixed tube 10 and collar 21 secure the tight fit between the fixed tube 10 and drive shaft 11.

The device according to the invention is mounted as follows:

1. Shaft 11 is slipped into tube 14, then the stop screw is screwed into shaft 11. After that the assembly 11, 14 is driven into the crown's head 13 and welded.
2. The two gaskets 23, 24 are slipped to the bottom portion of tube 10, and the thoric indexing gasket 18 is placed into groove 17 of tube 10.
3. The assembly 11, 13, 14 is mounted into tube 10, and the drive stem 4 is screwed and glued into shaft 11.
4. The entire assembly is driven into the middle 3 of the watch.

The present invention is not limited to the example of an embodiment described above. It will be clear to one skilled in the art that modifications can be introduced without leaving the scope of the claimed invention. For instance, fixed tube 10 could be left out, and annular groove 17 receiving the indexing gasket 18 could be formed directly in bore 2 of middle 3. Also, the relative positions of grooves 19, 20 and groove 17 could be inverted, that is, grooves 19, 20 could be formed in the inner wall 10' of fixed tube 10, while groove 17 receiving the indexing gasket 18 could be formed in the outside of mobile tube 14. Another modification could be to add one or several additional axial positions for crown 12 that are indexed, either by one or several additional annular grooves on mobile tube 14 in

the device of the invention, or in the conventional way inside the watch movement, in order to allow other functions in the watch such as winding, setting, etc. to be controlled. One could also add to the device of the invention a compression key like that described in the document EP 1 280 023 in order to enhance the tight fit of the device in the rest position of crown 12.